

Docket No.: 21854-00042-US  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Hartley F. Young

Application No.: Not Yet Assigned

Confirmation No.:

Filed: Concurrently Herewith

Art Unit: N/A

For: RAIL SEAT ASSEMBLY

Examiner: Not Yet Assigned

**CLAIM FOR PRIORITY AND SUBMISSION OF DOCUMENTS**

MS Patent Application  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Applicant hereby claims priority under 35 U.S.C. 119 based on the following prior foreign application filed in the following foreign country on the date indicated:

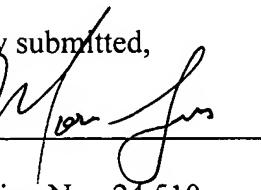
Country	Application No.	Date
Australia	2003901653	April 9, 2003

In support of this claim, a certified copy of the said original foreign application is filed herewith.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 21854-00042-US from which the undersigned is authorized to draw.

Dated: April 1, 2004

Respectfully submitted,

By   
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**Patent Office  
Canberra**

I, LEANNE MYNOTT, MANAGER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003901653 for a patent by AIRBOSS RAILWAY PRODUCTS INC. as filed on 09 April 2003.

WITNESS my hand this  
Twelfth day of March 2004

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**LEANNE MYNOTT  
MANAGER EXAMINATION SUPPORT  
AND SALES**

AUSTRALIA  
*Patents Act 1990*

## **PROVISIONAL SPECIFICATION**

**200390                  filed 9<sup>th</sup> April 2003**

**Invention Title : Rail Seat Assembly**

**Applicant: AirBoss Railway Products Inc.**

**Inventor: Hartley Frank Young**

The invention is described in the following statement:

## RAIL SEAT ASSEMBLY

This invention relates to rail roads and in particular preassembled rail fastening components for rail ties.

### 5      Background to the invention

Rail pads are used to electrically and dynamically insulate the rail tie from the rail and USA patents 4618093 and 5203502 are examples of rail pads used with elastic rail clip support shoulders that are fixed to the tie on either side of the rail. Often shims and gaskets are also placed under the rail pad.

10     It is now common practice for the rail pads to be placed in the rail seats at the rail tie manufacturing plant in order to save time at the track installation. The ties are usually stacked on flat rail cars at the tie plant. There may be 4 layers of ties with wooden dunnage between each layer. The dunnage sits on the rail seats. The pads gaskets and shims on the top layer may be blown off in transit or from any tie  
15    during installation. If this is not noticed and the rail ties are fed onto the track this can create difficult problems as the rail is automatically fed onto the ties even if the pads are not in place. Then the pads must be inserted after the mobile tie installation machinery has passed. This is difficult expensive and time consuming.  
Anther component of the rail fastening system is the insulator that lies between the  
20    rail and the rail fastener. USA patent 4379521 is an example of such an insulator.  
A recent development affecting the design of rail pads has been the adoption of deep post rail insulators where the portion of the insulator lying between the support shoulder and the rail flange extends below the bottom of the rail which means that the rail pad has to be modified to accommodate the deep post  
25    insulator. The deep post insulator can be accommodated by making a cut out in the edge of the pad. However this means that this type of pad is not suitable for pre assembly with the shoulders because it needs to be precisely located between the shoulders to accept the insulator post and it is difficult to reposition the pad when the rail is sitting on it. One attempt as shown in USA patent 5692677 has  
30    been to make the vertical post of the insulator slightly shorter so that a thin section of pad remains to locate the pad against the shoulder. The difficulty of this approach is that the tolerances required for all the parts means that the vertical

post has to be considerably shorter to accommodate variations in the dimensions of the other components.

Another difficulty with insulators of the type disclosed in USA patent 4379521 is that they wear out or break before the other components in the rail seat.

- 5     A problem associated with rail pads has been that under the cyclic load conditions of rail cars passing over the rail seat the pad could be forced out of position . One approach to dealing with that problem is to provide an upstanding projection on the outer edge of the pad adjacent the insulator so that movement of the pad would be inhibited because movement of the post would be resisted by the insulator. This
- 10    approach still allows considerable pad movement because of the tolerances required to ensure that the insulators could be fitted.

It is an object of this invention to address the above mentioned problems.

#### **Brief description of the invention**

- 15    To this end the present invention provides a rail seat which includes
  - a) a rail tie
  - b) a pair of rail fastening support shoulders mounted on said rail tie so that a rail can be held to the tie between said shoulders each shoulder having a rail face and side portions on each side of said rail face extending away from the rail
  - c) a rail pad adapted to lie on said tie between said shoulders which has a pair of projections extending parallel to the tie along side each side portion of each shoulder.
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When a deep post insulator is used on the rail seat the side portions of the shoulders each have a projection which abuts the end of the projections on the rail pad and the rail pad body is dimensioned to be no wider than the base cross section of the of the rail so that there is a recess between the rail face of the shoulder and the main body of the rail pad to accommodate the deep post of the insulator. The projections on the sides of the shoulders may take the form of ribs and enable the pads to be correctly located so that an appropriate recess is formed between the pad and each shoulder. This is a more effective method than using a thinner section of pad below the insulator to locate against the rail face of the shoulder.

This invention is partly predicated on the discovery that insulator wear can be inhibited if the insulator post has a bearing area that matches that of the rail face of the support shoulder. In the prior art the length of the insulator parallel to the rail was generally shorter than that distance for the rail face of the insulator so that the

- 5 insulator post could locate in the slot in the rail pad. This slot in the rail pad was usually the width of the rail face of the shoulder which meant that, in order to ensure that the deep post insulator is located correctly, the width of the insulator post deep section was narrower than the rail face of the support shoulder. Therefor in another aspect this invention provides a recess in the rail pad adjacent the rail
- 10 face of the support shoulder which is wider than the rail face of the support shoulder. This ensures that the insulator post can be as wide as the rail face to have the maximum bearing area between the insulator and the support shoulder. Preferably the pad projections also abut the sides of the shoulders so that under cyclic load conditions any tendency of the pad to move is resisted by the sides of
- 15 the shoulders as well as the bottom of the insulator. The portion of the pad projections abutting the sides of the shoulders may be thickened in the vertical direction to further inhibit pad movement.

In order to retard displacement of the pads prior to the rail being placed in position the pad projections have resilient tabs projecting laterally toward the sides of the

- 20 shoulders so that they are deformed when the pads are placed on the rail seat to create a force fit between the pads and the shoulders to prevent accidental displacement of the pads during transit and installation.

#### **Detailed description of the invention**

- 25 A preferred embodiment of the invention will be described with reference to the drawings in which:  
Figure 1 is a schematic cross section of a rail seat to which this invention applies;  
Figure 2 is a plan view of a rail pad according to this invention;  
Figure 3 is a side view, from the rail support shoulder, of the pad of figure 2;
- 30 Figure 4 is an end view along the line of the rail of the pad of figure 2;  
Figure 5 is the section B-B along the line B-B in figure 2;  
Figure 6 is a photograph of a support shoulder used with the rail pad of this invention.

The rail seat of this invention is based on concrete rail seats as described in USA patents 4618093 and 6045052 except that a deep post insulator is used which has a vertical portion which fits between the rail base and the rail clamp support shoulder and extends downwardly below the level of the bottom edge of the rail.

- 5 The rail seat consists of a rail tie 10 having cast in place clamp shoulders 16 to which rail clamps 17 are fitted. These clamps 17 hold the rail 11 in place. The rail base 12 lies on a rail pad 13 which in turn lies on a rail plate 14. An insulator 18 lies between the rail base 12 and the toe of the rail clamp 17 and the rail face of the support shoulder 16. In this embodiment a deep post insulator 18 is used and 10 the post 19 extends below the bottom edge of the rail base 12 into a recess provided in the rail pad 13.

The rail pad 13 is made from a hard elastomeric material such as natural or synthetic rubber or polyurethane. The central portion may incorporate any suitable arrangement of grooves and recesses as taught in a number of prior art

- 15 patents such as USA 4618093, 6045052 or WO 98/13550.

The pad 13 which lies under the rail, has edges 21, extending laterally of the rail and edges 22, lying parallel and substantially below the edges of the rail base.

The corner projections 23 of pad 13 consist of a vertically thickened portion 27 having a face 25 which carries the gripper tab 26 and a face 24 which abuts the rib

- 20 30 of the rail support shoulder as shown in figure 5.

The pad is located correctly in position between the support shoulders by the corner projections 23. The faces 24 abutting the ribs 30 of the support shoulders ensure that the pad lies beneath the rail flange so that there is a gap between the edge 22 and the rail face of the support shoulder to accommodate the deep post

- 25 insulator. Recesses 29 are slightly greater than the thickness of the post of the insulator and space the portion 27 away from the line of edge 22. The recesses 29 extend beyond the width of the rail face of the support shoulder so that the insulator can be as wide as the rail face of the support shoulder to increase the bearing area. This enables the insulator to better resist the forces involved and
- 30 extends the insulators useful life.

The large area face 25 of each thickened corner projection 23 abuts the sides of the support shoulders to inhibit any tendency of the pad to move under the cyclic load conditions experienced during the passing of rail cars over the rail seat.

The tab 26 on face 25 ensures that the pad 13 is held tightly to the shoulder to prevent accidental displacement during shipping of the assembled rail tie from the manufacturing plant to the track location. The tab 66 is resiliently deformed when the pad 13 is pressed into position between the pair of rail clamp support shoulders.

5 From the above it can be seen that the present invention has uniquely solved problems associated with preassembled rail seats particularly those using deep post insulators. Those skilled in the art will realize that the present invention may be put into practice in embodiments other than those described above without  
10 departing from the inventive concepts.

**CLAIMS**

1. A rail seat which includes
  - a) a rail tie
  - 5 b) a pair of rail fastening support shoulders mounted on said rail tie so that a rail can be held to the tie between said shoulders each shoulder having a a rail face and side portions on each side of said rail face extending away from the rail
  - d) a rail pad adapted to lie on said tie between said shoulders which has a 10 pair of projections extending parallel to the tie along side each side portion of each shoulder.
  - e) a deep post insulator having a portion lying between the rail face of the support shoulder and the edge of the rail pad parallel to the edge of the rail.
- 15 2. A rail seat as claimed in claim 1 in which the support shoulder has a projection extending from each side portion against which a face of the rail pad projections abut to locate the pad in position to accommodate the deep post of the insulator.
- 20 3. A rail seat as claimed in claim 1 or 2 in which the rail pad projections space the pad from the shoulder to create a recess for the deep post insulator that extends wider than the rail face of the support shoulder and the insulator is as wide as the rail face of the support shoulder.
- 25 4. A rail seat which includes
  - a) a rail tie
  - b) a pair of rail fastening support shoulders mounted on said rail tie so that a rail can be held to the tie between said shoulders each shoulder having a a rail face and side portions on each side of said rail face extending away 30 from the rail
  - c) a rail pad adapted to lie on said tie between said shoulders which has a pair of projections extending parallel to the tie along side each side portion

of each shoulder and a resilient tab on each projection adapted to abut the side portions of said support shoulder to retain the pad in position between the support shoulders.

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4. A rail seat which includes

- a) a rail tie
- b) a pair of rail fastening support shoulders mounted on said rail tie so that a rail can be held to the tie between said shoulders each shoulder having a rail face and side portions on each side of said rail face extending away from the rail
- c) a rail pad adapted to lie on said tie between said shoulders which has a pair of projections extending parallel to the tie along side each side portion of each shoulder the projections being proportioned to prevent the pad from moving out of position under the cyclical load conditions present when rail cars pass over the rail seat.

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5. A rail seat as claimed in claim 4 in which the projections on the rail pad are thickened in the vertical direction to provide a larger bearing surface on the sides of the support shoulder.

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6. A rail pad as defined in any one of claims 3, 4 or 5.

7. A support shoulder as defined in claim 2.

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**ABSTRACT**

A rail seat which includes

- a) a rail tie
- b) a pair of rail fastening support shoulders mounted on said rail tie so that a rail can be held to the tie between said shoulders each shoulder having a rail face and side portions on each side of said rail face extending away from the rail
- c) a rail pad adapted to lie on said tie between said shoulders which has a pair of projections extending parallel to the tie along side each side portion of each shoulder.

The rail seat is adapted to be used with a deep post insulator and incorporates a rib on the support shoulder extending from each side portion against which a face of the rail pad projections abut to locate the pad in position to accommodate the deep post of the insulator. The rail pad projections are proportioned to prevent the pad from moving out of position under the cyclical load conditions present when rail cars pass over the rail seat. A resilient tab is provided on each projection to abut the side portions of the support shoulder to retain the pad in position between the support shoulders.

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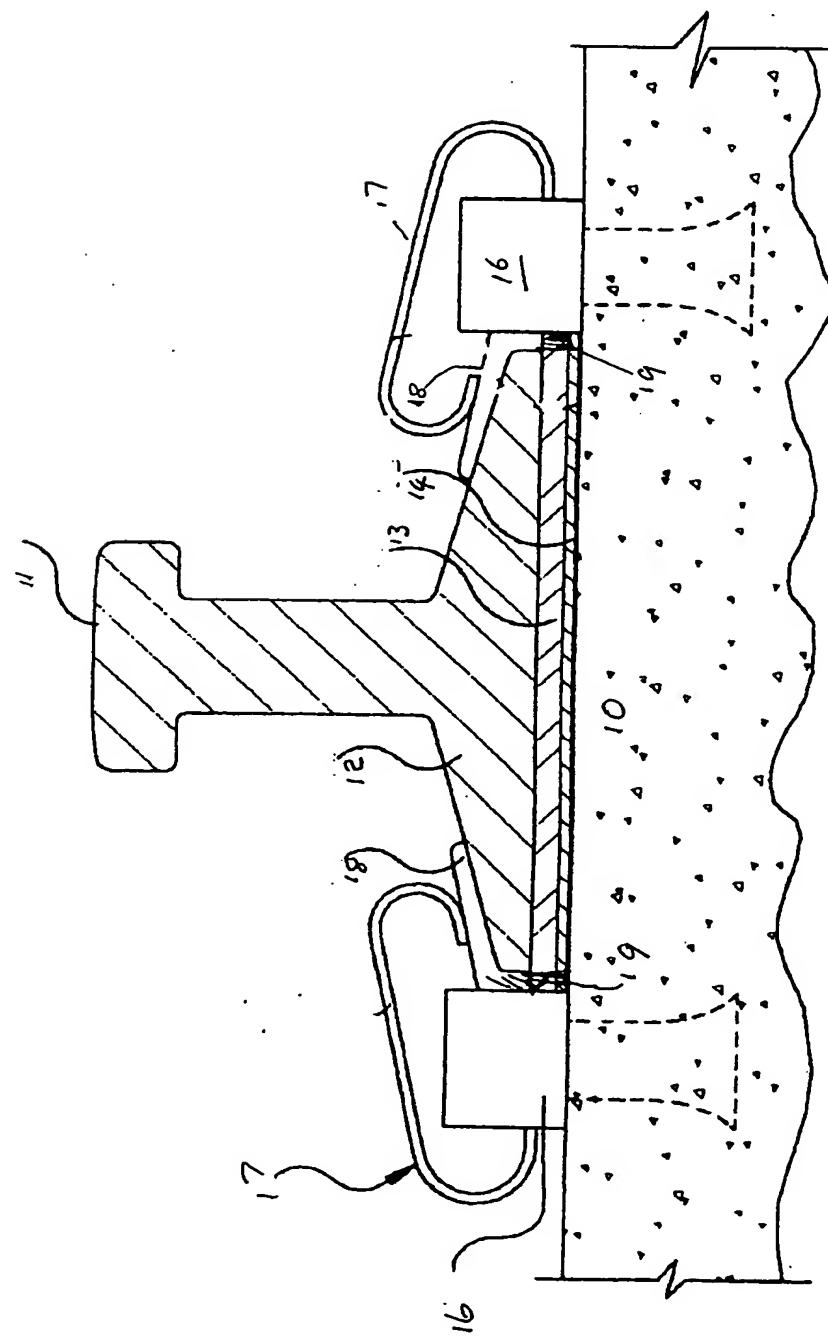


Figure 1

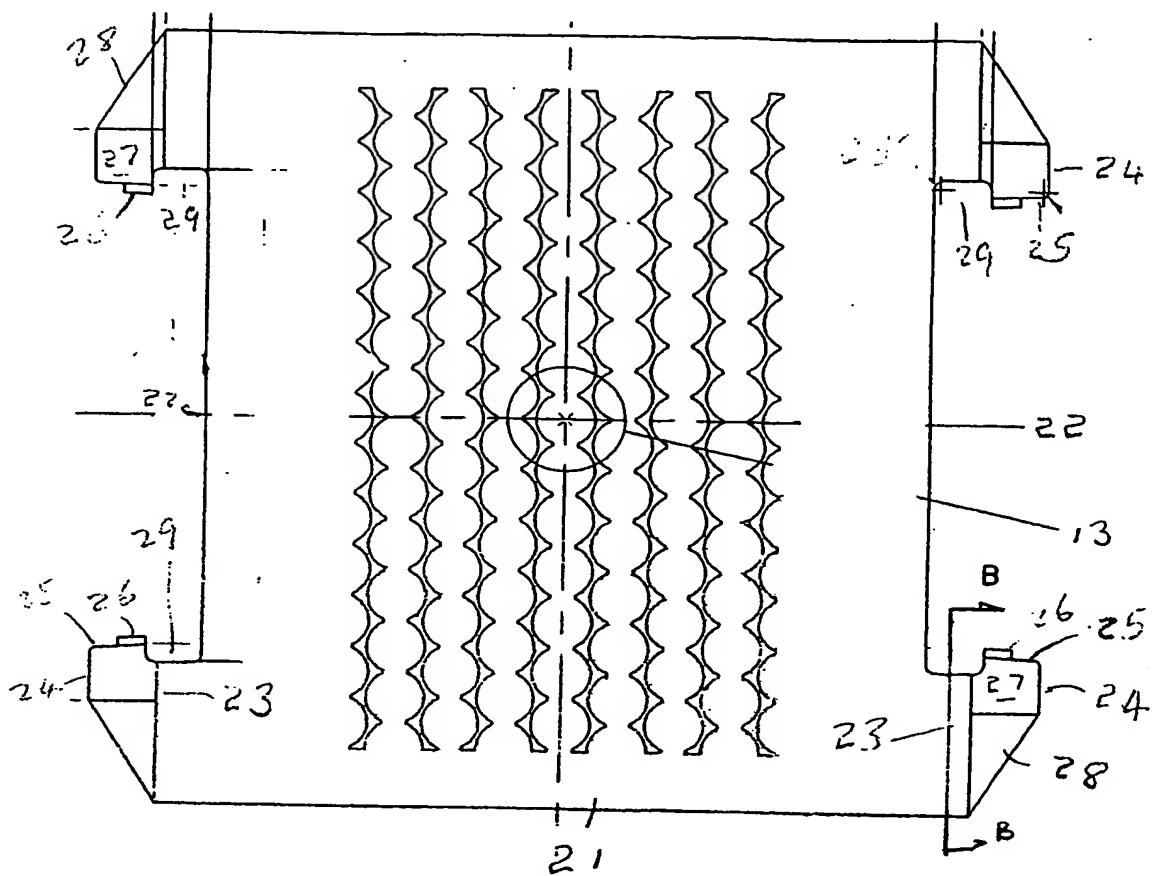


Figure 2

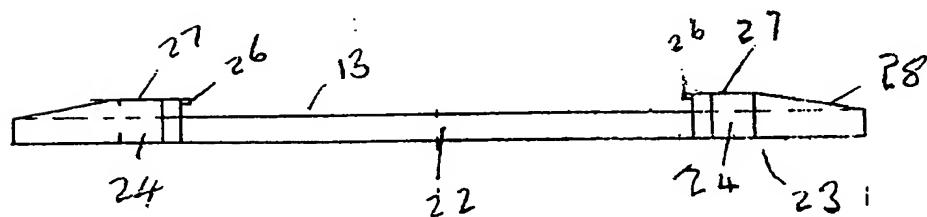


Figure 3

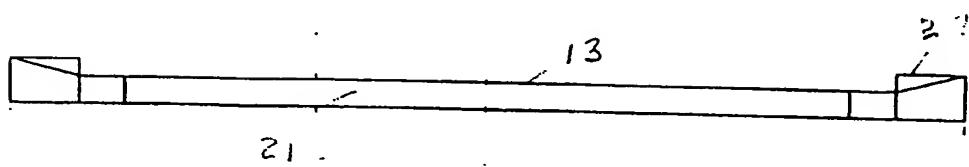
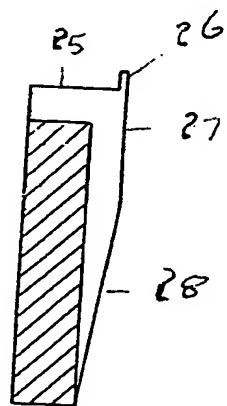


Figure 4



SECTION BB

Figure 5

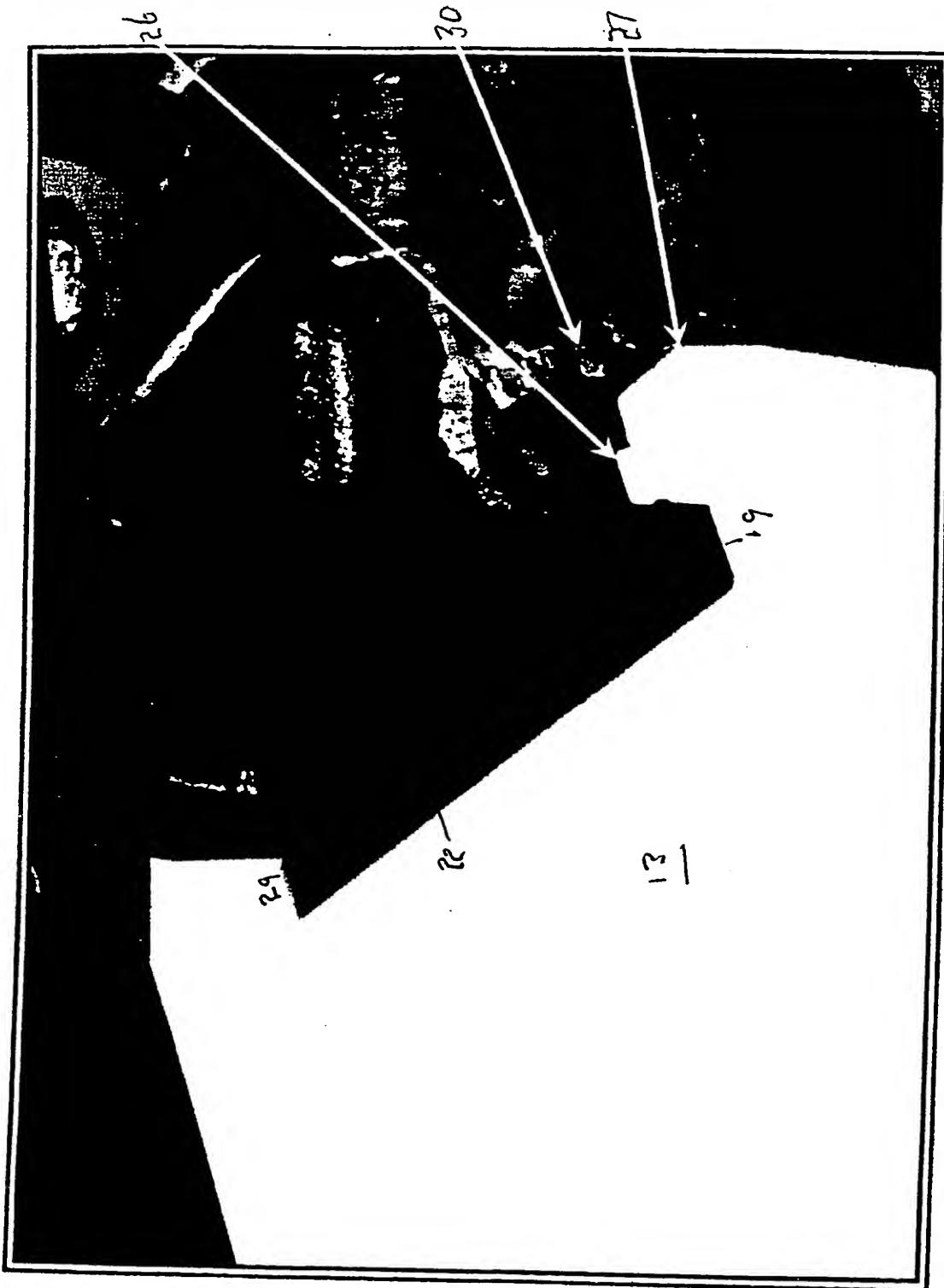


Fig 6